

blackish at the base, squamous, punctate-striate, the punctures large, quadrate, the rows somewhat interrupted and deflected by the interstitial armature; second interstice elevated at base and furnished with three strong teeth, the hinder one the largest, the elevation connected behind by a ridge with one on the apical half of the third interstice, which carries four very large erect acute teeth; fifth interstice (from the base to the middle) with a crest of seven acute teeth, increasing in size posteriorly; seventh with a toothed crest from near the base to the apex, which helps to form an acutely serrate margin to the elytra when seen from above.

Underside fusco-piceous, pilose and thinly scaled. Legs testaceous.

Hab. British Bechuanaland (*F. Whitworth Jones*).

The extraordinary development of the elytral armature in this species has no parallel among any described Scolytidæ, though it is feebly approached by some species of *Phlæosinus*. Of the teeth which compose it by far the largest are those on the third interstice. I possess three examples, of which one is much smaller than the other two and has this armature less developed. The frontal and antennal characters, however, correspond, and it is likely that all three are males, the small specimen being depauperized.

XLV.—*On the Seasonal Changes in the Plumage of Zosterops cærulescens.* By ALFRED J. NORTH, F.L.S., Ornithologist to the Australian Museum*.

IN describing *Zosterops westernensis* of Quoy and Gaimard in the 'Catalogue of Birds in the British Museum' †, Dr. R. Bowdler Sharpe makes the following observations:—"An Australian specimen has been described, and it is extraordinary that a bird which seems to be widely distributed on that continent should so much have escaped notice, the only allusion to the species that I can find in Mr. Gould's work being a passage where he mentions that some specimens of *Z. cærulescens* have the 'throat wax-yellow.' It seems to be the *Z. westernensis* (Q. & G.), a species re-instated in the system by Dr. Hartlaub (*J. f. O.* 1865) p. 20."

With a view of solving the mystery why so common a species should have been overlooked by most writers, I have given this subject my attention for the past two years, by

* From the 'Records of the Australian Museum,' vol. ii. no. 7, pp. 98-100.

† Gadow, *Cat. Birds Brit. Mus.* ix. p. 156 (1884).

careful observation and the collecting of a number of specimens of *Zosterops* found in the neighbourhood of Sydney. For a liberal supply of these birds every month, from January until the end of August, the thanks of the Trustees are chiefly due to Mr. H. J. Acland, of Greendale, and for a small series of Tasmanian skins to Mr. E. Leefe Atkinson, of Table Cape. Mr. J. A. Thorpe, the taxidermist, too, has assisted at various times, and from the specimens collected or sent me for examination has prepared a series of nearly fifty skins in every stage of plumage. The results of my observations conclusively prove that the *Z. westernensis* of Quoy and Gaimard, the type of which was obtained by them at Western Port, Victoria, is only the spring and summer attire of *Z. cerulescens* of Latham. Taking the two extreme phases of winter and summer plumage exhibited in *Z. cerulescens*, it can be easily understood why each phase should be thought to belong to a distinct species; and it is only where one has these birds under daily observation and obtains specimens during every month of the year that the intermediate stage or the gradual transition of one phase of plumage to the other is observed. These changes in the plumage of *Z. cerulescens* have already been pointed out by me in a series of skins exhibited in August last at a meeting of the Linnean Society of New South Wales. Typical examples of Latham's *Z. cerulescens** with the deep tawny-buff flanks and grey throat, the autumn and winter attire of this species, may be obtained in the neighbourhood of Sydney from the middle of April until the end of August. Some specimens, however, are to be found during April that have not quite lost their summer plumage, and in August others that have already begun to attain their spring livery; these birds have the yellow throat more or less clearly defined. Usually the first indications of losing the deep tawny-buff flanks and acquiring the yellow throat are seen, during a normal winter, about the second week in August, in some seasons a fortnight earlier; but in two specimens examined the grey throat was retained as late as 19th September. During August and September, however, the gradual transition from the winter to the spring attire (the *Z. westernensis* of Quoy and Gaimard) † is slowly taking place, and by the middle of October not a bird is to be seen with the deep tawny-buff flanks and the grey throat. Specimens shot in November have the throats of a brighter olive-yellow than at any other period of the year, the flanks at that time being of a very pale tawny brown. At midsummer,

* *Z. dorsalis* (Gould), Birds of Austr. iv. p. 81.

† Voy. de l'Astrolabe, pl. xi. fig. 4.

when the breeding-season with the species is virtually over, the throat is slightly paler than in the spring, and this livery is retained until the beginning of March. The flanks then become darker, increasing in intensity of colour from that time forward, the yellow feathers on the throat also disappearing and passing into grey until the autumn livery is again fully assumed by the end of April.

Of six specimens obtained at Table Cape, Tasmania, during April 1894, three have the throat grey, the remainder faintly washed with yellow, and in all of them the flanks are of a deeper tawny buff than in Australian examples.

The distinguishing characters in the seasonal changes of the plumage of the under surface of *Z. cærulescens* may be briefly summarized as follows:—

Spring plumage.—Throat bright olive-yellow; chest and breast ashy grey, passing into dull white on the abdomen; flanks very pale tawny brown; under tail-coverts dull white, in some specimens washed with yellow.

Summer plumage.—Similar to the spring, but the throat slightly duller in colour.

Autumn plumage.—Throat faintly washed with olive-yellow or gradually passing into grey; flanks tawny buff.

Winter plumage.—Chin and sides of the throat dull olive-yellow; centre of the throat, the chest, and breast ashy; flanks deep tawny buff; abdomen and under tail-coverts dull white, the latter in some specimens washed with yellow.

Transition from winter to spring plumage.—Throat greyish white, faintly washed with olive-yellow; flanks pale tawny buff; under tail-coverts dull white, slightly tinged with yellow.

Obs.—The average measurements of examples obtained during winter and in summer are alike. All through the year some specimens are found with the under tail-coverts tinged or washed with yellow. This does not appear to be a sexual character, although from the specimens examined the yellowish wash on the under tail-coverts predominates among the males. As a rule, however, the dull white or white under tail-coverts are found in birds obtained during the winter.

Under the synonymy of *Z. westernensis* Dr. Sharpe includes

Z. tephropleura of Gould, from Lord Howe Island, but the latter species can be readily distinguished from the spring plumage of *Z. cærulescens* by its bright yellow under tail-coverts and by its larger and more robust bill. At the Macleay Museum I have examined the type of *Z. Ramsayi*, described by Mr. George Masters from specimens obtained by him on one of the Palm Islands lying north of Halifax Bay, N.E. Queensland. It is a good and distinct species, with olive-yellow under tail-coverts and a broad zone of white feathers round the eye. Dr. Sharpe, from the description of this species given in the 'Proceedings of the Linnean Society of New South Wales'*, considers it probably identical with *Z. westernensis*; but there is no question that the specific character pointed out by Mr. Masters and the olive-yellow under tail-coverts will prevent one when examining this species from confounding it with the spring or summer plumage of *Z. cærulescens* or with any other Australian member of this genus.

MISCELLANEOUS.

On the Coloration of certain Insects of the Order Lepidoptera.

By ÉMILE BLANCHARD.

I HAVE made numerous experiments with a view to modifying the colour of certain Lepidoptera; these experiments have been made more particularly on the butterfly commonly known as the Peacock (*Vanessa io*), the most richly coloured of all our Lepidoptera. Taking young caterpillars on the point of hatching from the egg, I placed them in boxes under red, green or blue, and violet-coloured glass. On the day of hatching no colour had undergone the slightest modification. Individuals reared in complete obscurity were hatched as brilliantly adorned as those reared in the full light. As the larvæ of the Peacock feed on nettles, the stalks of nettles, passing through small holes in the bottom of well-closed boxes, were received in vessels of water, so as not to need renewing very often; when changing became necessary, this was done in a darkened chamber. Notwithstanding every care no alteration took place in any shade of the wing of the butterfly.

There is, however, one point of difference which appears well indicated—the action of light. A small species of the genus *Vanessa*, known by the popular name of Carte géographique, from the pattern of its wings, has two annual generations. In the individuals the whole of whose metamorphoses take place in the summer the wings are black: this is *Vanessa prorsa*. In the individuals which pass the winter in the pupa state the wings are fawn: this is the variety *levana*.—*Comptes Rendus*, Dec. 16, 1895.

* Vol. i. p. 50.